

XLVI.—*Excerpta Botanica, or abridged Extracts translated from the Foreign Journals, illustrative of, or connected with, the Botany of Great Britain.* By W. A. LEIGHTON, Esq., B.A., F.B.S.E., &c.

No. I. *On the Functions of the Hairs on the Stigma in the Fecundation of the Campanulaceæ.* By ADOLPHE BRONGNIART. (Ann. des Sc. Nat. n. s. xii. 244.)

THE upper surface of the stigma of the Campanulas is, as has been long known, clothed with long hairs, arranged in regular longitudinal lines correspondent to the number and position of the anthers, and especially visible in the flower-bud before the emission of the pollen. The connexion between these hairs and the pollen was first observed in many species of *Campanula* by Conrad Sprengel, subsequently with greater care by Cassini in *Campanula rotundifolia*, and has been since detected by Alphonse DeCandolle in all the Campanulaceæ, with the exception of the small genus *Petromarula*. On the dehiscence of the anthers previously to the expansion of the corolla, and whilst the stigmas continue still convergent, these hairs are found covered with a considerable mass of pollen, brushed as it were from the cells of the anthers. On the expansion of the corolla the stigmas separate and curve backwards, the anthers having shed their pollen wither away, the pollen deposited on the exterior of the stigma becomes detached, and the hairs disappear, leaving only slight asperities visible on the surface of the stigma. According to Cassini and DeCandolle these hairs are caducous. M. Adolphe Brongniart by a microscopic examination proves that they are not deciduous, but exhibit a phænomenon quite unexampled in the vegetable kingdom; viz. that they are retractile, similarly to the hairs of certain Annelides, or the tentacula of Snails. A longitudinal section of the style previously to the emission of the pollen shows these hairs to be cylindrical, slightly attenuated at the apex, and formed by a prolongation of the external cuticle of the epidermis, perfectly simple, and destitute of articulation or partition even at their base. Immediately under the base of each hair, in the subjacent cellular tissue, is a cavity equal in depth to one half or one third of the length

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of the hair continuous with the cavity of the hair itself, and to all appearance filled with the same fluid. This basal cavity does not extend beyond the superficial layer of the stigma, and has no connexion whatever with the tissue which lies at a greater depth.

On the expansion of the corolla, these hairs, which had before continued extended and covered with grains of pollen, retreat into the basal cavity in the cellular tissue, their terminal portion insheathing itself in the lower portion gradually as this lower portion itself retires into the basal cavity in the cellular tissue, until the apices alone of the hairs remain slightly projecting from the external surface of the stigma. In their retreat the hairs frequently draw along with them some grains of pollen, which apparently penetrate into the tissue of the style, but which in reality remain always in contact with the exterior surface of the hairs, as is clearly proved by applying the point of a needle and causing the hairs to reissue from their insheathment, when the pollen grains are instantaneously expelled. The pollen grains undergo no modification either during their application to the hairs or when drawn along with them in their retractile movement, and consequently no connexion exists between them and the interior of the style. The probable cause of this retractile movement Brongniart attributes to the absorption of the fluid contained both in the hair and in the cavity at its base.

Cassini, A. DeCandolle, Treviranus, and Link are of opinion that fecundation is effected by the action of the pollen on these hairs, but in Brongniart's estimation erroneously. For on dissecting the true stigmas of the *Campanulas*, viz. the internal surface of the stigmatic branches, after their divergence, the pollen grains are found dispersed on this surface and adhering to it as on all true stigmas, at first by the lubricating moisture of the part, and subsequently by the development and penetration of the pollen-tubes, which very soon extend into a bundle of fine elongated utricular tissue occupying the centre of the style. This tissue is in form hexagonal, perfectly distinct from the surrounding tissue, much denser, and coloured. Its separation is easily effected when it is found composed of cylindrical or slightly fusiform elongated utri-



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cules, which are coloured, laterally free, articulated to each other end to end, and containing very minute globules of fecula which turns blue on the application of iodine. The pollen-tubes which penetrate between the utricles of this tissue are readily detected by their much greater tenuity, the absence of articulations, and the very minute granules inclosed in them.

These observations satisfactorily dissipate all doubts as to the functions truly stigmatic performed by the parts which in the Campanulas correspond in position and appearance to the stigmas of other plants, and prove that these collecting hairs ("*poils collecteurs*") exercise only a secondary office in fecundation.

XLVII.—*Sketch of the Natural History of Leeds and its Vicinity for Twenty Miles.* By HENRY DENNY, Esq.

IN submitting this outline of the vertebrate inhabitants of the district of twenty miles round Leeds, I do not wish it to be considered as anything like perfect or complete. I have only inserted what have come under my own immediate knowledge and inspection, or have been communicated by scientific friends residing in the neighbourhood. There are many sources from which information might have been obtained to swell this list, I am fully aware, but to these I have not had access; such a skeleton as it is, however, I am not without hopes may be of service, as a foundation for the cultivators of natural history whose eye it may chance to meet, and whose means of acquiring important additions or corrections will enable them to finish the sketch which I have only attempted in outline. Of the mammalia frequenting this neighbourhood but little can be said; indeed little can be expected in the vicinity of large manufacturing towns, surrounded on all sides by smaller seats of industry, for such many of our villages are become, together with the clearing of moorland and inclosing of commons, numerous new roads, &c., the necessary concomitants of the spread of population and commerce, all of which are inimical to the wild inhabitants of a country.

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